

# Chapter 11

## Barriers for Remanufacturing Business in Southeast Asia: The Role of Governments in Circular Economy



Mitsutaka Matsumoto, Kenichiro Chinen, Khairur Rijal Jamaludin, and Badli Shah Mohd Yusoff

**Abstract** Remanufacturing is one of the key determinants in enhancing resource efficiency of economies and pursuing circular economy. Facilitating international remanufacturing supply chain enhances the effects of remanufacturing. This study focused on the current scenario in remanufacturing businesses and related policies in Southeast Asia through interviews with 12 companies in 4 Southeast Asian countries, namely Malaysia, Indonesia, Singapore, and Philippines, and 5 Japan-based companies having remanufacturing facilities in Southeast Asia. The study presents the barriers for the remanufacturing businesses and debates on the roles of the governments to promote remanufacturing.

**Keywords** Sustainable consumption and production · Remanufacturing · Southeast Asia · Global supply chain · Policy

### 11.1 Introduction

Consumerism is the human desire to satisfy oneself by owning, obtaining, and receiving products, goods, and services above one's basic needs. We are often convinced that we need to repurchase and replace goods that would have lasted for much longer.

There is increasing academic interest across the world on how the circular economy may contribute to the goals of sustainability. More than 35% of respondents

---

M. Matsumoto  
National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan

K. Chinen (✉)  
California State University, Sacramento, CA, USA  
e-mail: [chinen@csus.edu](mailto:chinen@csus.edu)

K. R. Jamaludin  
Universiti Teknologi Malaysia (UTM), Kuala Lumpur, Malaysia

B. S. M. Yusoff  
Universiti Kuala Lumpur (UNIKL), Kuala Lumpur, Malaysia

in the report by APICS (2014) stated that remanufacturing is an important method of complying with sustainability policies, goals, and requirements.

Supply chains, among the various sectors, have garnered greater worldwide attention due to the dynamic nature of present-day business environments (e.g., Angelis et al. 2017; Genovesea et al. 2017; Gupta et al. 2011). Global supply chains involve and connect multilevel businesses from various geographical contexts. Because the industry spans across sectors, regulated by different stakeholders across countries, inter-nation coordination is key for the growth of the industry. In other words, raising awareness among government officials regarding remanufacturing business and remanufactured goods is essential to ease trade restriction on cores and remanufactured goods, especially among the members of regional economic integration. While most remanufacturing activities have taken place historically in the United States and Europe, Asia holds excellent potential for the future growth of remanufacturing (Liu et al. 2014).

This study focused on the current scenario in remanufacturing businesses and related policies in Southeast Asia through interviews with 12 companies in 4 Southeast Asian countries, namely Malaysia, Indonesia, Singapore, and the Philippines, and 5 Japan-based companies having remanufacturing facilities in Southeast Asia. The aim of this paper is to seek to explore the following questions:

- What are some of the challenges in inbound and outbound logistics?
- What is the role of governments in mitigating the consumers' perceived risks of remanufactured products?

The present study contributes to the literature on the circular economy on how ASEAN and their respective governments can play a critical role by formulating and implementing policies to manage better supply chains in emerging economies.

## 11.2 Literature Review

### 11.2.1 Framework

Nasr et al. (2017) used sensitivity analysis for supply chain remanufacturing processes to classify barriers into four categories: regulatory and access, technical, market, and recovery. Figure 11.1 summarizes four barriers. Technical barriers address challenges of the remanufacturing process. Challenges in the activities composing a remanufacturing process, such as disassembly, inspection, sorting, cleaning, reprocessing, reassembly, and inspection/testing, are well-documented in Steinhilper (1998) and Kurilova-Palaisaitiene et al. (2018). Recovery barriers are “typically a reflection of infrastructure and predominant end-of-use behavior in an economy,” but the scope is too broad, encompassing the social norms associated with diversion versus disposal, efficiency, cost, and convenience of diversion programs,

**Fig. 11.1** Barriers in remanufacturing value chain [Modified from Nasr et al. (2017)]

Technical Barriers
<ul style="list-style-type: none"> <li>• Access to skilled labor and equipment</li> <li>• Cost of reverse logistics and recovery</li> <li>• Access to required material inputs and cores</li> <li>• Production efficiency and waste generation</li> <li>• Access to distribution channel</li> </ul>
Recovery Barriers
<ul style="list-style-type: none"> <li>• End-of-use behaviors</li> <li>• Quality and efficiency of infrastructure</li> <li>• Diversion to recycling rate</li> <li>• Diversion to secondary market rate</li> <li>• Disposal to environment rate</li> </ul>
Regulatory & Access Barriers
<ul style="list-style-type: none"> <li>• Product/material-level transaction restrictions</li> <li>• Ability to import cores and export reman products</li> <li>• Ability to supply reman products</li> <li>• Permission to produce reman products domestically</li> <li>• Unclear definition of « reman » vs. « used » products</li> </ul>
Market Barriers
<ul style="list-style-type: none"> <li>• Attitudes towards « new » vs. « used » products</li> <li>• Previous experience with reman products</li> <li>• Access to and awareness of reman options</li> </ul>

allocation of the cost associated with reverse-logistics, overall diversion rate, and so forth.

The present study focuses on barriers that have “a real impact on the intensity of remanufacturing” (Nasr et al. 2017, p. 15): regulatory and access barriers and market barriers.

### ***11.2.2 Regulatory and Accessibility Concerning Cores and Remanufactured Products in ASEAN***

When regional economies agree on integration, trade barriers between the member countries fall, and their economic and political coordination increases. If it is successful, the integration can draw foreign direct investment, reduce tariffs, and enable the rise of a major manufacturing hub in the region.

Association of Southeast Asian Nations (ASEAN) is a regional political and economic organization comprising ten countries in Southeast Asia. ASEAN mainly aims to curb regional measures that lead to inefficiencies in global economic integration (Lloyd and Smith 2004). Until the late-1990s, the increase in economic interdependence in the region took place without any formal framework of economic cooperation. While there has been a strengthening of its institutions in recent years,

Schwartz and Villinger (2004) argue that ASEAN does not have a strong framework. It lacks a formal, detailed, and binding options which enable the institution to prepare, enact, coordinate and execute policies (Hew 2006). It is argued that this weak institutional structure “has been a major reason for the relatively low impact of ASEAN’s initiatives to reduce tariffs and eliminate non-tariff barriers” (Hew 2006). Some ASEAN members intentionally restrict imports of goods to protect their domestic industries (Kojima 2017). In the case of trade of remanufacturing, “unintentional trade restrictions on cores and [remanufactured products] exist” (Kojima 2017, p. 642). Whether intentional or not, a government’s restrictive trade policy can impact businesses by making it more challenging for inbound and outbound supply chains to trade across international borders. Therefore, it is essential for ASEAN countries to facilitate trade through harmonization of logistics policies and international trade procedures to lower total costs of production (Nguyen et al. 2016).

### ***11.2.3 Market Barriers: Building Trusts in Remanufactured Products***

Credible quality certifications can guarantee product quality, and help in mitigating consumers’ perceived risks of remanufactured products (Michaud and Llerena 2011; Kissling et al. 2013; Wang et al. 2013). Building trust and confidence in remanufactured products is vital because the remanufacturing started receiving wider recognition since 1970s in the US (Hormozi 1997). Certification from authorized parties provides strict guidelines for remanufactured products or remanufacturing processes and can “reduce the frequency and mitigate consequences of market failures” (Vertinsky and Zhou 2000, p. 231). Credible quality certifications assure the consumers regarding product quality and thus help mitigate the consumers’ perceived risks of remanufactured products (Michaud and Llerena 2011, Kissling et al. 2013; Wang et al. 2013).

Matsumoto et al. (2018) found that certifications of remanufactured auto parts influence purchase intentions. They show that, in the Southeast Asian countries, consumers are more willing to purchase certified remanufactured auto parts than uncertified ones. They find that automobile OEMs are trusted the most, followed by those certified by remanufacturing industrial associations, international standard organizations, government or public organizations, and remanufacturing companies. Certifications provide information regarding environmentally friendly features of remanufactured products, including energy saving, extending the lives of landfills, and reducing air pollution.

### 11.3 Interviews

Based on the literature review, the present study focuses on the two likely barriers: (1) regulations on the trade of cores and remanufactured products and (2) trust on remanufactured products.

The study adopted the interview method with remanufacturing companies that included questions on the aforementioned items. The study is based on the interviews with 12 remanufacturing companies in 4 Southeast Asian countries (Malaysia, Indonesia, Singapore, and the Philippines) and five Japan-based companies having remanufacturing facilities in these countries. A part of the interviews (nine interviews) were commissioned to a survey company in which the question items were prepared by the authors, and the other interviews (eight interviews) were conducted directly by the authors. The product areas included: auto parts, electronics products (mainly personal computers), photocopiers, heavy-duty and off-road (HDOR) equipment components, and ink and toner cartridges. In the interviews, we first asked the basic features of the companies' businesses that include the companies' profiles, their remanufacturing businesses, market properties, and the companies' market shares. Then, we inquired the regulations on trade of cores and remanufactured products. Next, we asked the companies' customers' perceptions of remanufactured products. The interviews were supplemented with desktop surveys on regulations and markets.

### 11.4 Results

#### 11.4.1 *Regulatory and Access Barriers*

A desktop survey of the regulations in the four countries was conducted before the interviews. Table 11.1 summarizes the results. This study found that the Indonesian government restricts the imports of used capital goods. The cores for remanufacturing are mostly in the category of used capital goods. A large mining industry thrives in Indonesia, and major global mining machine OEMs (or HDOR OEMs) such as Caterpillar, Komatsu, and Hitachi Construction Machinery have set up their remanufacturing facilities here. A few of these companies import used parts for remanufacturing. The government issues an importer's identification number (API) to a company in order imports goods. Acquiring an API is often difficult, especially for foreign-affiliated companies. The permit to import used goods is even more difficult to obtain. Global HDOR OEMs that import used parts for remanufacturing collaborate with the Indonesian companies having the said permits. The opportunities for such collaborations are also limited. The interview results revealed that the regulation restricts remanufacturing and lacks fairness.

In Indonesia, refurbished photocopiers have a high market share. The local Indonesian companies import used photocopiers and supply refurbished photocopiers to the local market. A photocopier refurbisher stated in the interview that Indonesia restricts

**Table 11.1** Regulations on trades of cores and remanufactured products

Country	Regulations or NTM on trades of non-newly manufactured products
Malaysia	None on remanufactured products. Approved Permit (AP) is required to import used cars and construction machines. Restrictions on imports of old electronics equipment
Indonesia	Restrictions on imports of used capital goods. Restrictions on imports of used cars
Singapore	None
Philippines	Restrictions on imports of used cars and tires. Imports of parts of used trucks or buses are allowed only for accredited rebuilding centers

Compiled from the information in the following sites and (Kojima 2017)

<https://www.apec.org/Groups/Committee-on-Trade-and-Investment/Market-Access-Group/NTM/>  
[http://www.federalgazette.agc.gov.my/outputp/pua\\_20110826\\_perintah%20kastam\(nilai-nilai%20kenderaan%20motor%20pasang%20siap%20yang%20diimport\)%20-complete.pdf](http://www.federalgazette.agc.gov.my/outputp/pua_20110826_perintah%20kastam(nilai-nilai%20kenderaan%20motor%20pasang%20siap%20yang%20diimport)%20-complete.pdf)  
[https://www.jetro.go.jp/world/asia/my/trade\\_02.html](https://www.jetro.go.jp/world/asia/my/trade_02.html) [https://www.jetro.go.jp/world/asia/ph/trade\\_02.html](https://www.jetro.go.jp/world/asia/ph/trade_02.html)

[https://www.jetro.go.jp/world/asia/sg/trade\\_02.html](https://www.jetro.go.jp/world/asia/sg/trade_02.html)

<https://www.jetro.go.jp/world/qa/04J-101001.html>

<https://www.jetro.go.jp/world/qa/04J-101103.html>

<https://www.jetro.go.jp/world/qa/04A-031102.html>

[https://www.jetro.go.jp/ext\\_images/jfile/country/idn/trade\\_02/pdfs/idn2F010\\_exp\\_hinmoku.pdf](https://www.jetro.go.jp/ext_images/jfile/country/idn/trade_02/pdfs/idn2F010_exp_hinmoku.pdf)

<http://www.regulasi.kemiperin.go.id>

<http://setkab.go.id/en/minister-of-industry-to-allow-import-of-second-hand-capital-goods/>

the imports of used products but permits the imports of used “black and white” photocopiers. However, the imports of used “color” photocopiers are not permitted, and it forms a major obstacle for the company’s business today.

In other countries, the interview responses did not find extensive regulatory barriers that strongly affected trade in both remanufactured goods and cores. Among the eight auto-parts remanufacturers or traders interviewed in ASEAN, namely Malaysia, Singapore, and the Philippines, at least five companies are importing cores from countries such as Japan, the United States, China, Germany, the United Kingdom, and other European countries.

Core import can also be affected by global agreements, such as the Basel Convention. The Basel Convention restricts the movements of hazardous waste between nations, and specifically to prevent the transfer of hazardous waste from developed countries to less-developed countries (Kojima 2017). However, the interviews results revealed that some OEMs have concerns regarding the trend of tightening trade restrictions of used products. Currently, it is unclear whether the Basel Convention prohibits the trade of cores for remanufacturing purposes if they contain harmful substances, for example, in some products in the electrical apparatus and IT product sectors. Several countries, companies, and lobby groups have sought clarification on the Basel convention with regard to repair, recondition, and remanufacturing, contending that imported/exported goods for these purposes (and particularly if the restored products are destined to be exported back to the original market) should not be classified as waste. Malaysia, one of the major remanufacturing countries

in ASEAN, supports this issue to open up trade of cores for refurbishment and remanufacturing. Moreover, the 3R Action Plan adopted at the G8 summit in 2004 stipulated that it seeks “to reduce barriers to the international flow of goods and materials for recycling and remanufacturing, recycled and remanufactured products, and cleaner, more efficient technologies, consistent with existing environmental and trade obligations and frameworks.”

Our interview revealed a host of technical and administrative complications in ASEAN, including lack of clarity in the understanding and defining the nature of remanufacturing, tariff and non-tariff measures, or intentional and unintentional trade barriers. So-called ‘spaghetti bowl effect’ (Hew 2006) which may be a stumbling block to ASEAN (Schwartz and Villingner 2004; Kojima 2017). According to an interviewee, the unclear definition of used versus remanufactured goods results in customs authorities treat remanufactured goods sometimes as used products and as remanufactured products in other cases. Therefore, a common definition of remanufactured goods in regional integration is urgently required.

#### ***11.4.2 Building Trusts in Remanufactured Products***

Customers’ acceptance of remanufactured products is another key factor for remanufacturing to proliferate in the market (Matsumoto et al. 2018a, b). Several of the companies interviewed, in particular, those remanufacturing auto parts and consumer products such as ink toners and home electronics products, mentioned that customers’ unawareness about the quality of remanufactured products is obstacles for their businesses.

In remanufacturing of OEMs, the remanufactured products are generally inspected similarly as new products, and they are provided the same warranties as new products. The major customers are aware of the inspection processes. On the other hand, in the case of non-OEM remanufacturing, customers generally are larger concerned about product quality.

Some non-OEM auto-parts remanufacturers stressed the importance of warranty. For example, an auto-parts remanufacturer interviewed in Malaysia claimed to provide 2-year warranties for products.

Many of the interviewed non-OEM remanufacturers rely on ISO 9001 accreditation to show that they have robust quality management systems as a fundamental requirement for producing high-quality products. Other relevant standards included the IEC series that outlines the safety and performance requirements for electrical apparatus. Malaysian government (MATRADE) supports remanufacturers to understand the relevant import requirements that may affect their ability to trade.

Some interviewees stated that a few certifications by the government for remanufactured products are effective because credible quality certifications help in guaranteeing the product quality and help in mitigating customers’ perceived risks of remanufactured products. Quality seals applicable to remanufacturing also exist. For example, the EC mark and NOM mark certifying that a new product is compliant with

the import requirements of the EU and Mexico, respectively, are equally applicable for remanufactured products that wish to enter those markets. The effectiveness of the government-issued quality certificates concerning that of industry-led systems depends on the extent of the market development of remanufactured products. In the nascent phase of the market, the government-led certificate systems are more likely to be effective. Because credible quality certifications can guarantee product quality, and help in mitigating consumers' perceived risks of remanufactured products, we recommend ASEAN's policymakers to consider measures to educate consumers and improve image of remanufactured products in the region.

### ***11.4.3 Notes on Policy in Malaysia***

Malaysia currently has a narrow focus on the remanufacturing industry. Toner and inkjet cartridges are the primary subsectors with majority of the companies (nearly 40% of the identified firms). However, it has the potential to build a strong automobile-related remanufacturing industry with the existing manufacturing base, coupled with the availability of an established and sound automotive recycling industry.

The present-day remanufacturers believe that the Malaysian government can play an important role in developing the industry by influencing policy levers. For example, offering investment tax incentives, amending or clarifying import policies, and creating a certification program to instill consumer confidence in high-quality remanufactured products are all considered to be beneficial to further develop the remanufacturing industry. For the policies on quality control and customer awareness, the emphasis should be on introducing a remanufactured product quality seal for remanufactured parts and supporting awareness campaigns on remanufacturing. The existing quality standards for new goods can be applied to remanufactured goods as well. Economic incentives should be granted to firms certified to meet the required standards for high-value remanufacturing.

The Malaysian government is currently in the process of stipulating quality standards for critical automotive parts, which will also include a quality seal. A few countries, including the United States, China, and Korea use a remanufactured product quality seal, although each country administers it differently. Quality seals in the United States are designed and administered by industry associations and in China by the government. Given the nascent market in Malaysia and the cross-cutting nature of the industry (motor vehicle parts, machinery, electrical, and more sectors), quality control for remanufactured products in Malaysia is currently more suited to a government-led model than industry-led. Relevant bodies in the Malaysian government, including MITI, Standards Malaysia, DOSH, DOE, SIRIM, and MAI, are well-positioned to deliver the key elements of quality control.

Malaysia needs to attract major global OEMs to set up remanufacturing facilities and significantly launch and grow the industry. The existing remanufacturers are still in a nascent stage, and they may find it challenging to access the export market. OEMs and OEM-authorized remanufacturers have a greater competitive advantage



compared with independent players along each step of the remanufacturing value chain. OEMs not only have access to the detailed technical specifications for each part to guide the remanufacturing process, but they can also leverage the existing capabilities from their manufacturing facilities, such as testing and machining equipment and technical know-how. At the sales and distribution stage, OEMs can lend their brand to the remanufactured product, thus providing better support for the product. Malaysian government led by MITI can play a role in promoting awareness of remanufactured products. This can be done through awareness campaigns, mainly targeted at businesses.

For increasing ease of trade, the Malaysian government should maintain the existing trade policies on cores, including the prohibition on import of items considered as e-waste, but continue to be open to case-by-case consideration of exemptions, as well as continue to allow imports of cores to be remanufactured under warranty.

Furthermore, to increase the ease of trade and promote remanufacturing in the country, the industry expects the government to coordinate and reduce the existing double taxation for trades, namely tax to import cores and to export remanufactured goods.

Malaysian government should enhance waste management (e.g., by establishing extended producer's responsibility, such as a take-back or deposit-refund system, or requiring to use a minimum amount of recycled material), enhance end-of-life vehicle (ELV) regulations in the medium term (e.g., by mandating a maximum percentage of an end-of-life vehicle that may be scrapped), and incorporate "consider remanufactured product first" guideline into the government procurement policy. These policies will help enhance both the supply of cores and the demand for remanufactured goods while creating a more sustainable economy and achieving cost savings for the government.

Malaysia has announced several policies such as the National Policy on the Environment that include sustainable development. The 10th Malaysia Plan also promotes sustainable development. The government should make a special mention in environmental regulations and policies that remanufacturing is an attractive means of reuse and sustainable development. This would build greater public awareness regarding the environmental benefits of choosing remanufactured products. Consumer awareness campaigns in this regard would also be useful. This would ensure that consumers have remanufactured products at the "top of mind" when making an environmentally friendly choice and increase customers' understanding of the quality and value proposition of remanufacturing to promote a sustainable economy, as well as increase the demand for remanufactured goods.

## 11.5 Summary

Remanufacturing is key to increasing the resource efficiency of economies and pursuing circular economy. Furthermore, enabling international remanufacturing supply chain is likely to enhance the effects of remanufacturing in increasing resource efficiencies.

This study found that restrictions on the trade of cores were a constraint on developing the remanufacturing supply chain. Policymakers must prioritize reduction of the barriers to the international flow of cores for remanufacturing while preventing the risks of inappropriate flow of e-wastes that can cause environmental pollution. The study also found that customers are unaware of remanufactured products and their value. Overcoming the unfavorable perception through marketing campaign and education is another priority. Developing credible quality standards or certifications is effective because it helps in mitigating customers' perceived risks of remanufactured products. The move toward international standards is effective, and it should include the perspectives of industry, government, and market stakeholders.

Remanufacturing provides a viable approach to enabling circular economies. It is important that industries are provided the market opportunities to create a strong supply chain and value chain in remanufacturing.

For our future research, it is interesting to examine the remanufacturing industry in ASEAN from historical perspectives. It is generally difficult to follow the process because precise market data of remanufactured products usually do not exist. This historical review may provide an insight into the growth of the remanufacturing market in ASEAN.

**Acknowledgements** This study was partially supported by the Environmental Research and Technology Development Fund (Project S-16) of the Environmental Restoration and Conservation Agency of Japan.

## References

- Angelis RD, Howard M, Miemczyk J (2017) Supply chain management and the circular economy: towards the circular supply chain. *Prod Plann Control* 29(6):425–437
- APIC (2014) Examining remanufacturing in supply chain and operations management. [http://www.apics.org/docs/default-source/scc-non-research/apics\\_research\\_reverse\\_short\\_1214.pdf?sfvrsn=2](http://www.apics.org/docs/default-source/scc-non-research/apics_research_reverse_short_1214.pdf?sfvrsn=2)
- Genovesea A, Acquayeb AA, Figueroaa A, Koha SCL (2017) Sustainable supply chain management and the transition towards a circular economy: evidence and some applications. *Omega* 66(Part B):344–357
- Gupta S, Goh M, Desouza R, Garg M (2011) Assessing trade friendliness of logistics services in ASEAN. *Asia Pac J Market Logistics* 23(5):773–792
- Hew D (2006) Economic integration in East Asia: an ASEAN perspective. UNISCI Discussion Papers. 11(May 2006)
- Hormozi AM (1997) Parts remanufacturing in the automotive industry. *Prod Inventory Manag J* 38(1):26–31
- Kissling R, Coughlan D, Fitzpatrick C, Boeni H, Luepschen C, Andrew S, Dickenson J (2013) Success factors and barriers in re-use of electrical and electronic equipment. *Resour Conserv Recycl* 80:21–31
- Kojima M (2017) Remanufacturing and trade regulation. *Procedia CIRP* 61:641–644
- Kurilova-Palisaitiene J, Sundin E, Poksinska B (2018) Remanufacturing challenges and possible lean improvements. *J Clean Prod* 172:3225–3236

- Liu Q, Goh M, Grag M, Souza RD (2014) Remanufacturing in Asia: location choice and outsourcing. *Int J Logistics Manag* 25(1):20–34
- Lloyd P, Smith P (2004) Global economic challenges to ASEAN Integration and competitiveness: a prospective look. REPSF Project 03/006a (September). <http://www.aadcp-repsf.org/docs/03-006a-FinalReport.pdf>
- Matsumoto M, Chinen K, Endo H (2018a) Paving the way for sustainable remanufacturing in Southeast Asia: an analysis of auto parts markets. *J Clean Prod* 205:1029–2014
- Matsumoto M, Chinen K, Endo H (2018b) Remanufactured auto parts market in Japan: historical review and factors affecting green purchasing behavior. *J Clean Prod* 172:4494–4505
- Michaud C, Llerena D (2011) Green consumer behavior: an experimental analysis of willingness to pay for remanufactured products. *Bus Strateg Environ* 20(6):408–420
- Nasr N, Kreiss C, Russell J (2017) Barriers to advancing remanufacturing, refurbishment, repair, & direct reuse: insights from the International Resource Panel. Rochester Institute of Technology and IRP. [http://ec.europa.eu/environment/international\\_issues/pdf/7\\_8\\_february\\_2017/Nabil\\_Nasr\\_sec2.pdf](http://ec.europa.eu/environment/international_issues/pdf/7_8_february_2017/Nabil_Nasr_sec2.pdf)
- Nguyen AT, Nguyen T, Hoang GT (2016) Trade facilitation in ASEAN countries: harmonisation of logistics policies. *Asian Pac Econ Lit* 30(1):120–134
- Schwartz A, Villinger R (2004) Integrating Southeast Asian economies. *The McKinsey Quarterly* (November 1, 2004)
- Steinilper R (1998) *Remanufacturing: the ultimate form of recycling*. Fraunhofer IRB Verlag, Stuttgart
- Vertinsky I, Zhou D (2000) Product and process certification—systems, regulations and international marketing strategies. *Int Mark Rev* 17(3):231–252
- Wang Y, Wiegerinck V, Krikke H, Zhang H (2013) Understanding the purchase intention towards remanufactured product in closed-loop supply chains: an empirical study in China. *Int J Phys Distrib Logistics Manag* 43(10):866–888